Pre-Proposal Staff Workshop
Utility Scale Renewables Energy (USRE)
RFP #500-10-503

TUESDAY, November 9, 2010

10:00 a.m. to 12:00 Noon

Presenters:
Prab Sethi
Joe O'Hagan
Rachel Grant

Hearing Room A
California Energy Commission
1516 Ninth Street
Sacramento, CA, 95814

Energy Commission Contacts

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Agenda

Introduction
Goals/Objectivs of Research Areas
Evaluation Process and Criteria
Administrative Information
Proposal Format and Required Documents
Proposal Evaluation/Scoring Criteria

Solicitation Purpose

- Help meet Research, Development and Demonstration (RD&D) needs related to more rapid and environmentally responsible deployment of Utility-Scale Renewable Energy (USRE) to the California electricity grid.
- Seek research solutions to improve intermittent renewable energy integration and reduce the environmental footprint of utility-scale energy development.

Background

- **Technologies Integration**
- **Energy storage**
- **Environmental Issues**

Background

- **Technologies Integration:**

- Technical challenges related to the technologies, tools and strategies for integrated and coordinated use.
- Some renewable energy resources, such as wind and solar, have variable energy output
- The current transmission infrastructure has limited capacity in remote high quality resource areas to support significant penetration of utility-scale renewable resources
- integration of renewable energy facilities with the surrounding environment in a manner that has low impacts for land, fresh water, sensitive species and ecosystem.
- Reducing the state's dependence on imported natural gas through improvement of natural gas alternatives, particularly solar thermal technologies, which are potential renewable resources that could reduce or displace consumption of natural gas.

Background

Energy storage:

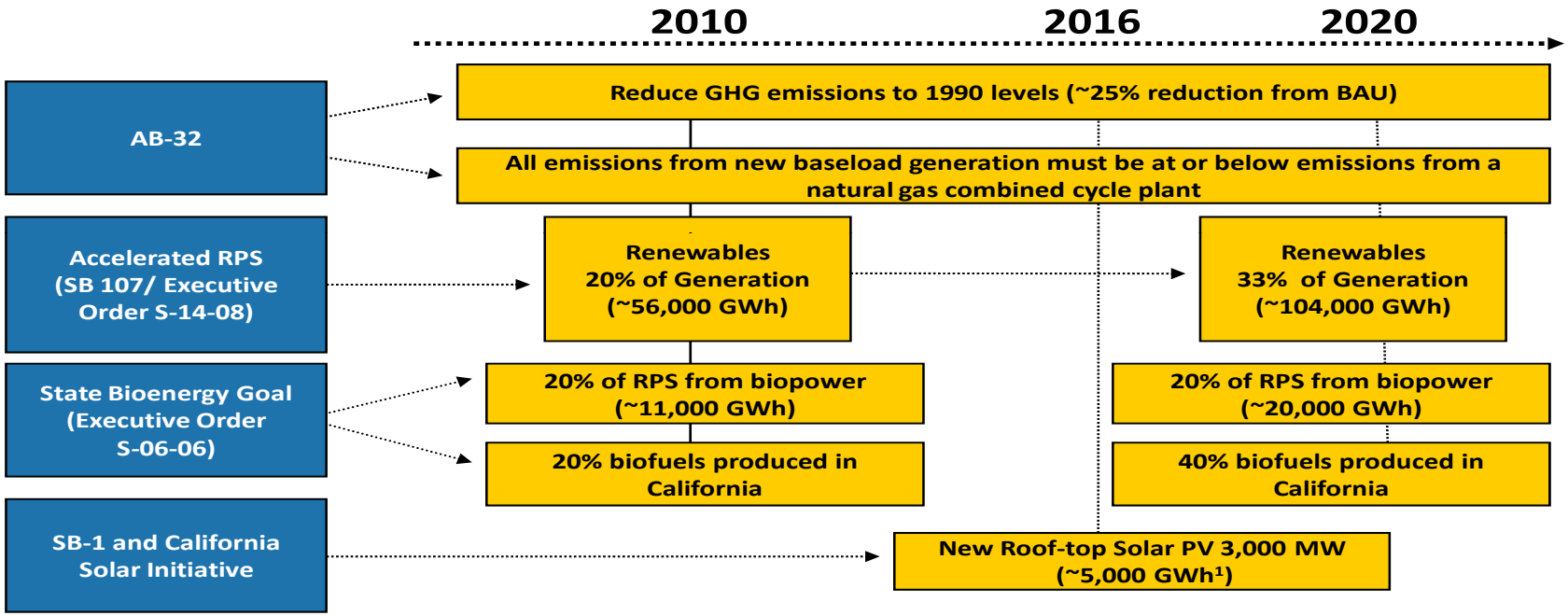
- Energy storage is a key enabling technology to improve solar power plant economic performance and value and/or *increase grid operational flexibility* to accommodate the variable nature of some renewable technologies.
- The operational flexibility and capacity of utility-scale storage in California is likely to become more important as the penetration of USRE resources increases.

Background

Environmental Issues :

- New renewable projects and transmission lines may create a range of significant and long-lasting environmental impacts.
  - For example, solar projects using current technologies involve extremely large areas: a single solar project can cover as much as 10,000 acres.
- A permanent loss of habitat for protected wildlife species and special status plants may occur. The availability of adequate mitigation land to compensate is uncertain, especially for expansive solar projects.
- Utility-scale and/or multiple adjacent projects in known or possible wildlife corridors would potentially constrain or eliminate important linkages between sensitive population groups.
- A cumulative loss of natural resources would occur as the impacts above are realized throughout California – especially in its ecologically fragile desert areas, where more than 100 projects are already proposed.

State Policy Goals



Research Areas

(RFP Pages 11-14)

The proposed projects must target one of the following four Research Areas:

A. Renewable Hybrid Generation and Energy Storage Integration Demonstration

B. Monitoring and Forecasting Analysis

C. Thermal Energy Storage Modeling

D. Environmental Mitigation for Utility-Scale Solar Energy Technologies

A. Renewable Hybrid Generation and Energy Storage Integration Demonstration

Eligible projects shall include the following two phases:

- Assessment study to include analysis and justification of the proposed hybrid and/or integration project.
- Demonstration of the proposed hybrid and/or integration project.

A. Renewable Hybrid Generation and Energy Storage Integration Demonstration

The Eligible Projects shall address one or more of the following technical objectives:

- Synergistic integration, at the power plant level, of a renewable generation source with another renewable generation resource and/or a storage resource in a way that enhances the value or reduces the cost of generation.
- Resolution of renewable energy integration issues across regions and technology (for example wind, solar, storage) mixes and provide quantitative metrics (such as cost of energy generation) to address those issues.
- Integration of variable renewable technologies, especially concentrated solar power (CSP), and demonstration of optimal sizing and configuration of high temperature thermal storage technology at different penetration levels.
- System hybridization and integration addressing the technical barriers to wide-scale deployment of utility-scale renewable technologies on the grid, by developing smarter technologies, supporting testing and field demonstration, and focus on economic barriers, including project design.

A. Renewable Hybrid Generation and Energy Storage Integration Demonstrations

Technical Objectives - Continued

- Building on development of existing modeling tools for intermittency/variability and integration projects with involvement of key stakeholders (such as CAISO, CPUC etc.). This will be supplemented by project testing and field demonstration.
- Develop low-cost and thermally efficient energy storage system, which helps in replacement of natural gas fired power plants with clean renewable resources.

B. Monitoring and Forecasting Analysis

The Eligible Projects shall provide analysis and modeling tools addressing one or more of the following technical objectives:

- Forecasting and monitoring of variable output renewable energy in a way that helps the grid accommodate its variable output. Particular emphasis should be placed on solar given the anticipated expansion of this area and the potential for solar generation to be deployed more diversely across system sizes and locations.
- Use of satellite data to track cloud formations and estimate times of cloud cover. Use of Doppler radar images and state of the art meteorological models to forecast cloud formations affecting solar power plant radiation capture.
- Use of satellite data, including ground-based calibration, to simulate electricity production by off-shore wind plants in selected area over a typical year and determine the relative accuracy of methods to forecast off shore production compared to on-shore production.

B. Monitoring and Forecasting Analysis

- Development of numerical and statistical mathematical models using real-time local and regional meteorological and power output data as well as historical data, to predict wind and solar output seconds, minutes, hours and days ahead of time.
- Improve the accuracy of forecasting, data collection, statistical parameters, data modeling/processing and control room integration day-ahead and hour-ahead markets and generate a critical input for grid-wide control and prediction systems.

C. Thermal Energy Storage Modeling

There is need for system analysis, as well as evaluation and improvement in performance and cost of thermal storage systems

The proposed modeling project shall address one or more of the following technical objectives:

- Thermal energy storage modeling for comparative evaluation of heat transfer and fluid dynamics of various storage systems (such as one- and two-tank thermocline), thermal energy storage media (such as molten-salt, high-temperature concrete and phase-change materials) to determine relative technical and performance objectives and the most appropriate option for various Concentrated Solar Power (CSP) systems (such as parabolic troughs, dish/Sterling engine and power tower), identifying and testing more cost efficient heat transfer fluids, storage materials, and storage system designs
- Resolution of system analysis issues related to optimum system options, evaluation and improving performance and cost of thermal storage systems and deployment of advanced heat transfer fluids and thermal storage systems (across all CSP technologies)

C. Thermal Energy Storage Modeling

- Evaluation modeling of storage coupled CSP configurations where natural gas supplementation would result in major electric system economic benefits
- Develop low-cost and thermally efficient energy storage system for CSP, so as to replace /displace natural gas consumption.
- Modeling and analysis activities related to identification and testing of more cost efficient heat transfer fluids, storage materials, and storage system designs across all CSP technologies. This includes various options such as direct compared to indirect sensible heat systems; liquid compared to solid storage materials; phase change materials.
- Study to better understand how high temperature storage would be sized and configured to maximize economic advantage in California CSP plants as CSP grid penetration increases.

D. Environmental Mitigation for Utility-Scale Solar Energy Technologies

This research area requests RD&D aimed at innovative utility-scale solar energy technologies, spatial arrays, and methods of installation/maintenance that result in significantly lowered facility footprint and/or land impact. This research area is also looking for innovative approaches to reduce the major freshwater consuming aspects of utility-scale solar energy.

D. Environmental Mitigation for Utility-Scale Solar Energy Technologies

The proposed project shall address one or more of the following technical objectives:

- Technology solutions or approaches that will support greater solar energy penetration in the California electricity grid by reducing project specific demands on land and fresh water, such as more efficient technologies that reduce land footprint per unit solar generation.
- Innovative technologies or approaches that significantly reduce negative impacts on sensitive species and/or ecosystems for a given amount of solar generation and/or significantly improve the sustainable co-existence of the solar plant and the surrounding wildlife and environment compared to current solar technologies or approaches

D. Environmental Mitigation for Utility-Scale Solar Energy Technologies

- Technologies that can better utilize areas of sub-optimal solar resources, and/or be installed on a wider or different range of slope and terrain than current solar technologies, and/or have greater flexibility in plant configuration and footprint shape, therefore expanding site selection options and opportunity for avoidance of sensitive or undisturbed habitats and increased utilization of disturbed or developed land for utility-scale solar.
- Alternative site preparation treatments with significantly reduced impacts on biological resources (for example, alternative site layouts, installation techniques that reduce grading).
- Innovative methods to mitigate the cost and performance penalties associated with the use of air cooled condensers or hybrid cooling technologies for power plant cooling (steam condensation) at solar thermal power plant projects.

Funding Availability

Target Area	Available	Max/proposal
A. Renewable Hybrid Generation and Energy Storage Integration Demonstration	$5,018,140	$2,000,000
B. Monitoring and Forecasting Analysis C. Thermal Energy Storage Modeling	$1,350,000 (For B & C)	$450,000
D. Environmental Mitigation for Utility-Scale Solar Energy Technologies	$1,000,000	$1,000,000
Total	$7,368,140	

Eligible Applicants

• This solicitation is restricted to private entities, including non-profit organizations and private universities

• Any public entities that can meet the requirements of this solicitation (e.g., Disabled Veteran Business Enterprise participation and match funding) and agree to the referenced terms and conditions that will be included in the resulting agreements.

• Even if public entities cannot meet these requirements or agree to the terms, they can still participate as subcontractors

Multiple proposals: Yes

However, each proposal must be for distinct, separate project and must be submitted separately adhering to all requirements contained in this solicitation.

Proposal Format

1. **A maximum of 40 pages**
2. **Additional information as appendix**
3. **Submit** original and **7 paper** copies of Volume 1 and Volume 2.
4. Bidders **must also submit** electronic files of the proposal on **CD-ROM diskette** along with the paper submittal.

Proposal Requirement

Proposal Volume 1 – Administrative Information

Attachment 1 - must include Addressed Research Area and Abstract (no more than 250 words)

Proposal Volume 2 – Technical and Cost information

Table of Contents	
Executive Summary	Attachment 13
Project Description	Attachment 14
Project Manager and Project Team	Attachment 14
Project Funding and Match Funding	Attachment 14
Royalty Payment Exemption	Attachment 14
Scope of Work	Attachment 16, Exhibit A
Schedule of Deliverables & Due Dates	Attachment 17, Exhibit A-1
Detailed Budget	Attachment 17, Exhibit B
List of Contacts, Key Personnel, and Key Subcontractors	Attachment 17, Exhibit F

Appendices:
Team Resumes
Match Funding Letters of Commitment
Other supporting documentation, if applicable

Proposal Screening Process

Administrative Screening

A proposal will be rejected if it falls under conditions mentioned in “Ground for Rejections” in Section IV – Administration Information.

Completeness Screening

A proposal must follow the format and contain all of the information described in RFP Section V. Proposal must contain sufficient information to enable a useful evaluation to be conducted.

Technical Eligibility Screening

Performance goals

Impacts and Benefits for California

California Policies

Technical Feasibility Screening

meet known scientific principles

Proposal Evaluation

1. A scoring committee will score the projects using the scoring criteria described in Attachment C.
2. A minimum score of 75 (out of 100) is required for funding.
3. Preference points will be added to the projects receiving at least the minimum score. These projects will then be ranked according to their overall score.
4. During proposal evaluation, the Energy Commission may invite the applicants to a clarification interview.
5. Project(s) will be recommended to the RD&D Committee for funding starting with the highest ranked project (for all categories) until all funds are exhausted

Schedule of Proposal and Award Process

Release of Solicitation	**November 2, 2010**
First Pre-Proposal Workshop	**November 9, 2010, 10:00 a.m. – Noon (Sacramento)**
Second Pre-Proposal Workshop	**November 16, 2010, 1:30 p.m. – 3:30 p.m. (San Diego)**
Deadline to Submit Questions	**November 19, 2006, 3:00 p.m.**
Posting of Questions and Answers	**December 7, 2010**
Deadline to Submit Proposals	**December 21, 2010 , 3:00 p.m.**
Interviews with Applicants (if necessary)	**January 18-21, 2011**
Review and Score Proposals	**February , 2011**
Release of Notice of Proposed Awards	**End of February (*Estimated)***
Energy Commission Business Meeting	**March/April , 2010 (*Estimated)***
Agreement Duration	***3 years***

Submission Requirements

Proposals must be *received* by the Energy Commission's Grants and Loans Office by 3:00 p.m. (PST) on Tuesday, December 21, 2010. Proposals must be delivered to:

RFP #500-10-503

Research needs for Utility-Scale Renewable energy

Contracts Office, MS-18

California Energy Commission

1516 Ninth Street, MS-1

Sacramento, CA 95814

Grounds for Rejection

Proposals *WILL* be rejected and not considered for funding if:

•The proposal is not received by the time and date set for receipt of proposal listed in this RFP (Public Contract Code, Section 10344(a)).

• The proposal contains confidential material.

• It does not contain a properly executed Contractor Certification Clauses Package

• The proposal is considered nonresponsive to the DVBE program requirements.

• It is lacking a properly executed Darfur Contracting Act certification.

• The proposal does not pass the administrative, completeness, technical eligibility, or technical feasibility screenings.

• The proposal identifies project costs as confidential (or proprietary), including labor rates, overhead, direct labor, other direct costs, profit, and the like.

• The bidder is a public entity, and did not submit a signed Agreement to Private Terms and Conditions Form

Grounds for Rejection

Proposals *WILL* be rejected and not considered for funding if:

- The proposal is primarily aimed at fulfilling regulatory permitting requirements of a specific project.
- The proposal is duplicative.
- The proposal does not identify match funding of at least 20 percent of the requested PIER funding or that the match funding does not meet the requirements set forth in this RFP

Grounds for Rejection

Proposals *MAY* be rejected

•It contains false or misleading statements or references which do not support an attribute or condition contended by the Bidder.

• The proposal does not comply with or contains caveats that conflict with this RFP.

• There is a conflict of interest as determined by the Energy Commission.

• The proposal is unsigned.

• The proposal is not prepared in the required format.

• The proposal fails to specifically address any of the research areas listed for this RFP, or addresses more than one of the proposed research areas in a single proposal.

SCORING CRITERIA

Scoring will be based on the merits of the proposed project in addressing each of the following topics. Each criterion will be scored on a basis of 0-10 points and then multiplied by the corresponding weighting factor. The resulting scores will be summed to provide the overall project score. A minimum score of 75 (out of 100) is required to be eligible for funding.

1. Technologies/Innovations, Policy, Barriers, and Gap Analyses

- Does the proposal sufficiently address the goals and one specific research area of this solicitation?
- How will the project help with addressing California's energy policies, including AB32, Renewable Portfolio Standard goals, and environmental laws?
- Does the proposal identify the current status of the subject technology/innovation as has been developed by the research and industrial community at large? What research has been done or is currently being performed on this topic? How will the proposed project leverage results from previous work?
- Does the proposal clearly address significant barriers, knowledge gaps, and solutions to the expanded development of renewable energy at the utility-scale? How is science and technology advanced?
- Does the proposal explain how the project is unique, critically needed and not duplicative of other efforts?
- To what degree does the proposed project contribute to a balanced portfolio across technology types, levels of risk, and/or time to commercialization?

2. . Technical Goals and Descriptions of Proposed RD&D

- Does the proposal describe the quantitative/measurable technical and economic performance goals? What criteria will be used to determine project successes and failures? How will necessary improvements be implemented?
- Does the proposed project clearly describe the validity of the proposed technical approach, as well as the likelihood of success based on the soundness of the scientific and engineering principles employed?
- Are the technical tasks clearly and logically presented, with appropriate objectives, discrete tasks, sequence of activities, appropriate deliverables, schedule, and budget?
- Does the proposal include a sound project plan that indicates the expected outcome and likelihood of success?
- Does the proposal state and quantify the specific benefits, such as cost reduction, energy penetration, reliability improvement, and reduced environmental impacts that the proposed project will provide to electricity ratepayers?

3. Cost Points

- Is the project cost consistent with the proposed work?
- Are the project personnel rates, operating expenses, and overhead costs reasonable for the proposed work and consistent with experience of the project team?
- Is the expected PIER funding appropriate and consistent with the expected level of public benefits resulting from the proposed project?
- Degree to which the economical potential for the proposed project exceed PIER investment?

4. Project Manager, Project Team, Match Funding and Market Connectedness

- Does the proposal justify that the project manager and team members have the technical capabilities and specific experience to successfully manage the project, including scope, schedule and cost, and report results and accomplishments in a timely and effective manner?
- What past and current work related to the proposed technology/innovation has been performed by the project team, including successes and failures?
- Does the proposal express degree of commitment from applicant and project partners as evidenced by letters of commitment or support?
- Does the proposal indicate stakeholders and beneficiaries of the proposed technology?
- Does the proposal include a sound plan for the communication of project results to the market?
- How efficiently can the project team replicate and scale the proposed technology?
- Is the portion of the budget provided by match funding representative of the ratio of private benefit to public benefit that the project results will provide?
- Is the level of match funding consistent with the expected timeframe for commercialization of the proposed technology?

A. Renewable Hybrid Generation and Energy Storage Integration Demonstration Projects

*–Following criteria will be used for research area A **only**:*

- Does the proposal include both phases outlined in the research areas section: Assessment study and demonstration project?
- To what degree does the project address barriers to greater hybridization and integration of multiple renewable energy and storage technologies?
- Does the proposal include a thermodynamic analysis, including discussion and graphical representation of mass and energy balance?
- Does the proposal include an assessment study, including capital and operating costs, cost/benefit analysis, payback period, installed cost per MWe, Levelized Cost of Energy (LCOE), Return on Investment (ROI), avoided cost of electricity, quantification of overall climate change benefits of the project?
- Does the proposal clearly describe how the new technology or innovation will reduce environmental impacts?
- Does the proposal indicate replacement/displacement of natural gas consumption?

B. Monitoring and Forecasting Analysis Projects – *Following criteria will be used for research area B **only***:

- How does the proposed project improve the accuracy of forecasting for intermittent renewable technologies?
- Does the proposal describe the extent of improvement in the generation resource planning and operation?
- How will the project results be used to improve scheduling and transmission planning?

C. Thermal Energy Storage Modeling Projects-
*Following criteria will be used for research area C **only***:

- How will the proposed project advance the economic and/or technical benefit of thermal storage?
- Does the modeling include heat transfer fluid, storage material and storage design across different CSP technologies?
- Does the proposal show assessment of replacement/displacement of natural gas consumption
- Does the proposed modeling technique consider major factors associated with thermal energy storage? What is the predicted accuracy of the model?

D. Environmental Mitigation for Utility-Scale Solar Energy Projects

*–Following criteria will be used for research area D **only***:

- Has the proposal clearly defined the environmental issue being addressed?
- Does the proposal convincingly address a new, innovative technology or approach aimed at reducing environmental impacts of utility-scale solar plants?
- Does the proposal clearly and quantitatively describe how the technology or innovation will significantly reduce environmental impacts of utility-scale solar?
- Is the project important within the context of reducing or avoiding negative environmental impacts of solar energy development?
- Are prior/planned/pending permitting-related activities of the applicant, its employees, subcontractors, or collaborators disclosed?

Availability of Solicitation Documents and Information

This solicitation and all supporting documents and forms can be found at
http://www.energy.ca.gov/contracts/index.html
under "Current Solicitations."

Interested parties may also sign on to the electronic mailing list on this webpage to ensure they are notified of any changes to this solicitation.

Questions

Additional questions about this Solicitation must be submitted via e-mail or letter by 3:00 p.m. on November 19, 2010.

The questions and answers will be posted on the Energy Commission's website by December 7, 2010.

THANK YOU

Research Needs for Utility-Scale Renewable Energy

California Energy Commission

Request for Proposals

RFP # 500-10-503

Pre-Bid Conference

Date: Tuesday, November 9, 2010

Proposal Requirements

REQUIRED FORMAT FOR PROPOSAL RESPONSE

Consists of Two Sections:

- Volume 1 – Administrative Section
- Volume 2 – Technical & Cost Section

Section 1:
Administrative Response

Cover Letter	
Application and Project Information Form	Attachment 1
Contractor Certification Clauses	Attachment 2
Small Business Preference Certification	If applicable
Completed Disabled Veteran Business Enterprise form Std 843	Attachment 5
Bidder Declaration form GSPD-05-105	Attachment 6
California Based Entity Questionnaire (CBE)	Attachment 8
Target Area Contract Preference Act Std 830	Attachment 9
Enterprise Zone Act Preference (Eza) Request Std 831	Attachment 10
Local Agency Military Base Recovery Area Act Std 832	Attachment 11
Darfur Contracting Act Certification	Attachment 12

Section 2:
Technical and Cost Section

Table of Contents	
Executive Summary	Attachment 13
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Schedule of Deliverables and Due Dates	Attachment 17 Exhibit A-1
Detailed Budget Forms	Attachment 17 Exhibit B
List of Contacts, Key Personnel, and Key Subcontractors	Attachment 17 Exhibit F
Customer References	Attachment 15
Appendices: Team Resumes Match Funding Letters of Commitment Other Supporting Documentation, if applicable	

Small/Non-Small Business Preference

- Small Business Preference – California State Certified Small Businesses or micro-businesses can claim the five percent preference when submitting a proposal. See RFP, page 14and attachment 3 for more information.
- Non-Small Business Preference – Bidder commits to small or micro business subcontractor participation of 25% of net bid price. See RFP, page 14 and attachment 3 for more information.

California-Based Entity Preference

1. To receive CBE Preference, the proposal must include a CBE as either the prime contractor/recipient or a subcontractor. A CBE is a corporation or other business form organized for the transaction of business that:
   - Either has its headquarters or an office in California AND
   - Substantially manufactures the product or substantially performs the research within California that is the subject of the award.
2. The budget must show that the CBE(s) will receive 50% or more of the PIER funds awarded.

California-Based Entity (Cont.)

3. The proposal must receive a passing score prior to any preference points being added. The preference points will be awarded as follows:

Base Score (score prior to any preference points being added)	CBE Preference Points
75-80	1
81-85	2
86-90	3
91-95	4
96-100	5

Disabled Veteran Business Enterprise (DVBE) Requirements

Bidder must commit to meet or exceed the DVBE participation requirements of 3% of the total Bid amount by either of the following methods:

Method A1 – Proposer is a Certified DVBE

Method A2 – Subcontractor is a certified DVBE and will receive at least 3% of the Agreement amount

DVBE (cont'd)

A copy of an Agreement between the Contractor and the DVBE must be submitted prior to contract award. The Agreement may be in draft form but must show that the DVBE meets the Commercially Useful Function requirements as defined in the RFP.

DVBE (cont'd)

Incentive

The DVBE Incentive Program gives a contractor an opportunity to improve their bid status based on the efforts attained from the DVBE Participation Program. DVBE information is located in Attachments 3, 4 and 5.

Proposed DVBE Participation Level	DVBE Incentive % Point Preference	DVBE Incentive Points
3.01% - 3.99%	1%	1
4% - 5%+	2%	2

Tentative Key Activities and Dates

ACTIVITY	ACTION DATE
RFP Release	November 2, 2010
Pre-Bid Conference	November 9 and 16, 2010
Deadline for Submittal of Questions, no later than 3 PM	November 19, 2010
Distribute Questions/Answers and Addenda (if any) to RFP	December 7, 2010
Deadline to Submit Proposals, no later than 3 PM	December 21, 2010
Interviews with Bidders (if necessary)	January 18-21, 2011
Posting of Notice of Proposed Awards	February 22, 2011 (estimated)
Commission Business Meeting	March 2011 (estimated)
Agreement Start Date	April 2011 (estimated)
Agreement End Date (duration 3 years)	April 2014 (estimated)

Questions and Answers

Question and Answer Session

Whom to Contact

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